WHAT IS CLAIMED IS:

1. An apparatus for detecting a signal indicative of at least one of a heart beat, a heart rate, and one or more ECG waveforms of an animal comprising:

a first multiplexer for receiving a signal from each of a plurality of electrodes arranged to permit contact by a part of an animal for a period of time, wherein the first multiplexer includes a first output comprising the signal of a first electrode of the plurality of electrodes;

a second multiplexer for receiving a signal from each of the plurality of electrodes, wherein the second multiplexer includes a second output comprising the signal of a second electrode of the plurality of electrodes; and

a differential circuit for receiving the first output of the first multiplexer and the second output of the second multiplexer, wherein the differential circuit outputs a differential signal, based upon the first output of the first multiplexer and the second output of the second multiplexer, indicative of at least one of a heart beat, heart rate and an ECG waveform of an animal.

2. The apparatus according to claim 1, wherein the first multiplexer and the second multiplexer represent a common multiplexer.

3. The apparatus according to claim 1, further comprising a third multiplexer for receiving the output of the differential circuit and the output of the first multiplexer, wherein the third multiplexer includes a third output comprising either the differential signal or the signal from the first multiplexer.

4. The apparatus according to claim 3, further comprising a processor for controlling the operation of one or more of the first, second and third multiplexers and/or processing the third output signal from the third multiplexer.

5. The apparatus according to claim 4, further comprising an analog to digital converter for converting the output of the third multiplexer to a digital signal for processing and/or analysis by the processor.

6. The apparatus according to claim 4, wherein the processor is capable of analyzing the third output signal to output a signal indicative of at least one of a heart-beat, heart rate and an ECG waveform of an animal.

7. The apparatus according to claim 1, further comprising an amplifier for amplifying a signal from an electrode.

8. The apparatus according to claim 1, further comprising an amplifier for each electrode for amplifying a signal emanating therefrom.

9. The apparatus according to claim 8, wherein the electrodes are positioned adjacent a corresponding amplifier.

10. The apparatus according to claim 1, wherein one or more electrodes are each positioned on a column.

11. The apparatus according to claim 10, wherein one or more of the columns are electrically shielded.

12. The apparatus according to claim 10, wherein the columns are movable.

13. The apparatus according to claim 1, further comprising the plurality of electrodes, wherein the electrodes are positioned within an area and spaced apart from one another a predetermined distance.

14. The apparatus according to claim 13, wherein the predetermined distance comprises a distance to promote the likelihood that a single appendage of the animal will contact a single electrode.

15. The apparatus according to claim 13, wherein the plurality of electrodes form a grid.

16. The apparatus according to claim 1, wherein the differential circuit comprises a differential amplifier.

17. The apparatus according to claim 1, wherein the processor includes an output for sending a signal indicative of at least one of a heart beat, a heart rate and an ECG waveform of an animal in contact with at least two of the electrodes to a computer.

18. The apparatus according to claim 1, wherein the electrodes comprise a silver/silver-chloride alloy.

19. A method for detecting a signal indicative of at least one of a heartbeat, a heart rate, and an ECG waveform of an animal comprising:

scanning each of a plurality of electrodes for a signal indicative of contact by an animal;

selecting a signal from each of at least a pair of electrodes, wherein each selected electrode includes a signal indicative of contact with the animal;

creating a differential signal from the signals of the at least a pair of electrodes; and

determining at least one of a heart beat, a heart rate and an ECG waveform.

20. The method according to claim 19, further comprising extracting ECG waveform parameters from the one or more ECG waveforms.

21. The method according to claim 20, further comprising extracting the variability and/or the coefficient of variability among one or more ECG waveform parameters of a plurality of ECG waveforms.

22. The method according to claim 20, wherein the waveform parameters comprise at least one of P-peak, Q-trough, R-peak, S-trough and T-peak.

23. The method according to claim 20, further comprising extracting interval information between a pair of waveform parameters.

24. The method according to claim 20, wherein the interval information includes at least one interval of the interval between the P and Q parameters, the interval between the P and R parameters, the interval between the P and S parameters, the interval between the P and T parameters, the interval between the Q and R intervals, the interval between the Q and S parameters, the interval between the Q and T parameters, the interval between the R and S parameters, the interval between the R and T parameters, and the interval between the S and T parameters.

25. The method according to claim 19, further comprising providing the plurality of electrodes spaced apart from one another a predetermined distance for contact by an animal.

26. The method according to claim 19, further comprising displaying at least one of the heart beat, the heart rate and the ECG waveform.

27. The method according to claim 26, further comprising displaying at least one of the ECG waveform parameters of the one or more ECG waveforms, intervals therebetween, and the variability and/or the coefficient of variability among one or more ECG waveform parameters of a plurality of ECG waveforms.

28. The method according to claim 19, further comprising amplifying the signal from each electrode.

29. The method according to claim 19, wherein scanning comprising testing each electrode for the presence of a signal indicative of contact on the electrode by a part of an animal.

30. The method according to claim 19, wherein the signal comprises a predetermined level of electrical noise.

31. The method according to claim 19, wherein the signal indicative of contact with an animal comprises an increased level of electrical interference.

32. The method according to claim 19, further comprising filtering at least one of one or more signals from the electrodes and/or the differential signal.

33. The method according to claim 32, wherein filtering comprises filtering out electrical signals of about 50Hz and/or about 60Hz.

34. A system for detecting at least one of a heart beat, a heart rate and an ECG waveform of an animal comprising:

scanning means for scanning each of a plurality of electrodes for a signal indicative of contact by an animal;

selecting means for selecting a signal from each of at least a pair of electrodes, wherein each selected electrode includes a signal indicative of contact with the animal;

creating means for creating a differential signal from the signals of the at least a pair of electrodes; and

determining means for determining at least one of a heart beat, a heart rate and an ECG waveform from one or more differential signals.

35. The system according to claim 34, further comprising the plurality of electrodes spaced apart from one another a predetermined distance for contact by an animal.

36. The system according to claim 34, wherein the determining means comprises a processor.

37. The system according to claim 34, wherein any one or more of the scanning means and selecting means comprise a multiplexer controlled by a processor.

38. The system according to claim 34, wherein the creating means comprises a differential circuit.

39. The system according to claim 34, wherein each signal of each electrode is amplified.

40. The system according to claim 38, wherein the differential circuit comprises a differential amplifier.

41. An apparatus for detecting at least one of a heart beat, a heart rate and an ECG waveform of an animals, the apparatus comprising a plurality of electrodes spaced apart from one another a predetermined distance and positioned on columns, wherein each electrode passes a signal indicative of a heartbeat of the animal upon the presence of a part of the animal in contact with an electrode.

42. The apparatus according to claim 41, wherein the plurality of electrodes are retractable.

43. A computer readable medium having computer instructions provided thereon for enabling a computer to perform a method for detecting a signal indicative of at least one of a heart beat, a heart rate, and an ECG waveform of an animal, the method comprising:

scanning each of a plurality of electrodes for a signal indicative of contact by an animal;

selecting a signal from each of at least a pair of electrodes, wherein each selected electrode includes a signal indicative of contact with the animal;

creating a differential signal from the signals of the at least a pair of electrodes; and

determining at least one of a heart beat, a heart rate, and an ECG waveform from the differential signal.

44. An application program operable on a computer system for enabling the computer system to perform a method for detecting a signal indicative of at least one of a heart beat, a heart rate, and an ECG waveform of an animal, the method comprising:

scanning each of a plurality of electrodes for a signal indicative of contact by an animal;

selecting a signal from each of at least a pair of electrodes, wherein each selected electrode includes a signal indicative of contact with the animal;

creating a differential signal from the signals of the at least a pair of electrodes; and

determining at least one of a heart beat, a heart rate, and an ECG waveform from the differential signal.

45. A method for detecting a signal indicative of at least one of a heart beat, a heart rate, and an ECG waveform of an animal comprising:

scanning the plurality of electrodes over a predetermined time period, wherein scanning comprises:

computing the maximum of absolute values of substantially all the electrode signals during the predetermined time period;

determining at least a first pair of electrodes signals having the highest maximum value relative to other electrode signals;

determining whether the signals from the first pair of electrodes greater than a predetermined threshold value; and

determining a differential value from the signals of the first pair of electrodes upon the value of the signals being greater than the threshold;

capturing a plurality of differential values via scanning, wherein the captured differential values represent a waveform; and

processing the waveform.

46. The method according to claim 45, wherein processing comprises:

determining a frequency distribution of the waveform;

comparing the frequency distribution of the waveform to a predetermined frequency distribution of a predetermined ECG waveform; and

comparing the maximum and/or mean amplitude of the waveform to predetermined maximum and/or mean amplitude values of the predetermined ECG waveform upon the frequency distribution of the waveform coming within the frequency distribution of the predetermined ECG waveform;

returning to the capturing step upon the maximum amplitude value corresponding to the maximum amplitude value of the predetermined ECG waveform and/or the mean amplitude value of the waveform corresponding to the mean amplitude value of the predetermined ECG waveform.

47. The method according to claim 45, further comprising returning to the scanning step if the maximum amplitude value fails to correspond to the maximum amplitude value of the predetermined ECG waveform and/or the mean amplitude value of the waveform fails to correspond to the mean amplitude value of the predetermined ECG waveform.

48. The method according to claim 45, further comprising subsequently scanning of the electrodes upon the determination that the signals from the first pair of electrodes are less than a predetermined threshold value.

49. The method according to claim 45, wherein computing of absolute values comprises:

acquiring a sample signal representing a voltage sample from a first electrode;

calculating the absolute value of the sample signal of the first electrode; and

storing the absolute value of the sample signal for the first electrode as a new maximum upon the absolute value of the sample signal being the largest for the first electrode.

50. The method according to claim 45, further comprising displaying the waveform.

51. A computer readable medium having computer instructions provided thereon for enabling a computer system to perform a method for detecting a signal indicative of at least one of a heart beat, a heart rate, and an ECG waveform of an animal, the method comprising:

scanning the plurality of electrodes over a predetermined time period, wherein scanning comprises:

computing the maximum of absolute values of substantially all the electrode signals during the predetermined time period;

determining at least a first pair of electrode signals having the highest maximum value relative to other electrode signals; and

determining whether the signals from the first pair of electrodes are greater than a predetermined threshold value;

determining a differential value from the signals of the first pair of electrodes when the value of the signals is greater than the threshold;

capturing a plurality of differential values via scanning, wherein the captured differential values represent a waveform; and

processing the waveform.

52. An application program operable on a computer system for performing a method for detecting a signal indicative of at least one of a heart beat, a heart rate, and an ECG waveform of an animal, the method comprising:

scanning the plurality of electrodes over a predetermined time period, wherein scanning comprises:

computing the maximum of absolute values of substantially all the electrode signals during the predetermined time period;

determining at least a first pair of electrode signals having the highest maximum value relative to other electrode signals; and

determining whether the signals from the first pair of electrodes are greater than a predetermined threshold value;

determining a differential value from the signals of the first pair of electrodes when the value of the signals is greater than the threshold;

capturing a plurality of differential values via scanning, wherein the captured differential values represent a waveform; and

processing the waveform.